N° 20,356 A.D. 1902

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COMPLETE SPECIFICATION.

"A Process and Apparatus for Distilling"

I, FULBERT CALMANT, Chemist, of 113 Rue St. Charles, Paris, France, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention relates to a new process of distillation, applicable both to liquids and to solids, and characterised by the fact that the vapours or gases resulting from the action of the heat on the body under distillation are submitted to an energetic stirring or mixing which facilitates, on the one hand, the distillation properly so called, by rendering more rapid the separation of the gases or vapours of different densities and different natures that arise from the body under distillation; and, on the other hand, this facilitates the purification of the gases or vapour, as the impurities separate out and are deposited more rapidly, inconsequence of aromatic or molecular disassociation.

This procedure facilitates distillation, effects it more rapidly, and actively aids in the purification of the vapours or gases, from which the impurities separate out or deposit themselves more rapidly.

To put this procedure into practice it is sufficient to arrange in the interior of the column of a still or of any distilling apparatus in general, one or more screw propellers or, in general terms, a ventilator or other apparatus turning at a sufficient speed to stir the vapours or gases energetically.

On the annexed sheet of drawings I have shown, by way of example, Fig. 1 a section, Fig. 2 a plan, of an apparatus in which the principle of my invention is applied in its most simple form of execution, whilst Fig. 3 shows a vertical section of a portion of the column of a still, or a tube, in which the various types of paddle may be used instead of a screw propeller, and *vice versa*.

The arrangement of Fig. 3 may be vertical or on an inclined plane, and so also the Figs. 1 and 2. In this case the position of the overflow outlets must be changed. There may be placed a perforated plate between each pair of ventilators in Fig. 3.

To resume, all these parts for stirring and for ventilation may be used one at a time or in unlimited number, either upon supporting plates as in Figs. 1 and 2, or in columns, or in the tubular parts where the vapour that comes from the body distilled circulates. Also all these organs of ventillation or agitation may be driven simply by the current of vapour or gas coming from the product under distillation, or by some mechanical movement as shown in Fig. 3.

As may be seen from the drawings, especially Fig. 1, the most simple method of putting my invention into operation consists in placing on a plate 1, and under a bell 2, of which the base or lower side is pierced by a great number of holes, a loose screw of some description, 3, mounted on a pivot, so as to reduce the friction to a minimum.

The vapours or gases coming directly from the distilling apparatus or from another similar condensation plate, ascend through the mouths 4, which are generally two in number and inclined so that the current of escaping vapour will strike upon the wings of the propeller 3 in such a way as is most advantageous

for securing the rapid rotation of this propeller, as well as an energetic stirring of the aforesaid gases or vapours. The heaviest vapours, which condense on the inside of the bell 2, trickle down its walls and then run off by the overflow orifice 5, whilst the vapours that are not condensed escape by the holes in the base of the bell to make their way to the other condensing plates, if that is necessary.

In this last case the condensed liquid coming from the upper plates runs off by the overflow pipe 6 which opens into a little cup 7, so as to form an hydraulic closure. In place of employing the current of vapour from the matter under distillation in order to drive the propeller, one may use devices for stirring and for ventillating as shown in Fig. 3, which contrivances are driven mechanically by motion received from the outside. This motion drives a vertical shaft 8; or the shaft may be inclined. Keyed on to it are a number of propeller blades or paddles, the number and the form of these being indefinitely variable, according to the nature of the material to be distilled.

The vapours or gases arrive from below at 9, and the portion that is not condensed escapes by 10, to make its way into another column, or even into one or several such plates as have been described with reference to Figs. 1 and 2. The liquid condensed from the vapours trickles along the walls, and runs off by an orifice at the bottom.

Whether one or other of these two types of apparatus be used, or even one after the other; the principle guiding their action is always the same. The vapour in circulation is subjected to an energetic agitation or mixing, and the effect of this is to provoke a more rapid condensation of the heaviest vapours, at the same time purifying these same vapours or gases.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. A process for the distillation of liquid or solid bodies, characterised by the feature that the gases or vapours arising from the distillation are subjected to an energetic agitation and mixing, with the object of facilitating the separation of impurities, of separating vapours of different densities, and of facilitating the concentration of the distilled product, substantially as described.

2. An apparatus for carrying out the process claimed in Claim 1, in which one or more ventilators are arranged in the distilling apparatus, on one or more shafts that are moved either mechanically from the outside, or by the vapours or gases which strike upon the vanes of the said ventilators, substantially as described.

3. In an apparatus such as claimed in Claim 2, an arrangement in which the ventilator is enclosed under a bell placed in the very midst of the vapours or gas, substantially as described.

Dated this 16th. day of September 1902.

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CALMANT'S Complete Specification.

(1 SHEET)

Fig. 3.

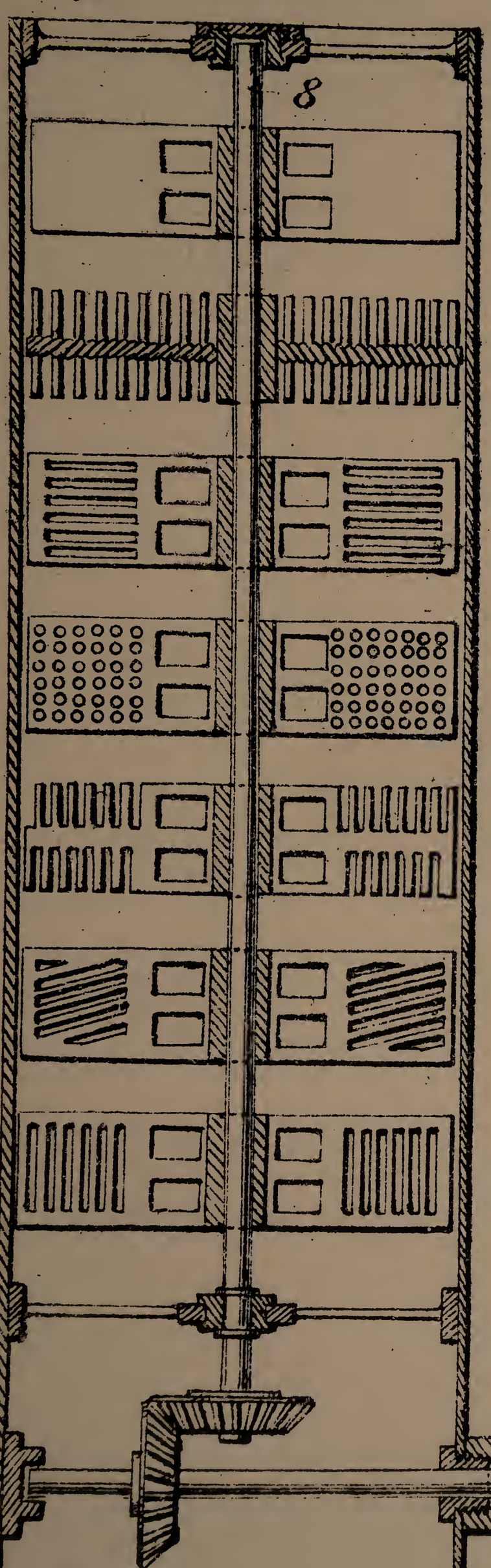


Fig. 1.

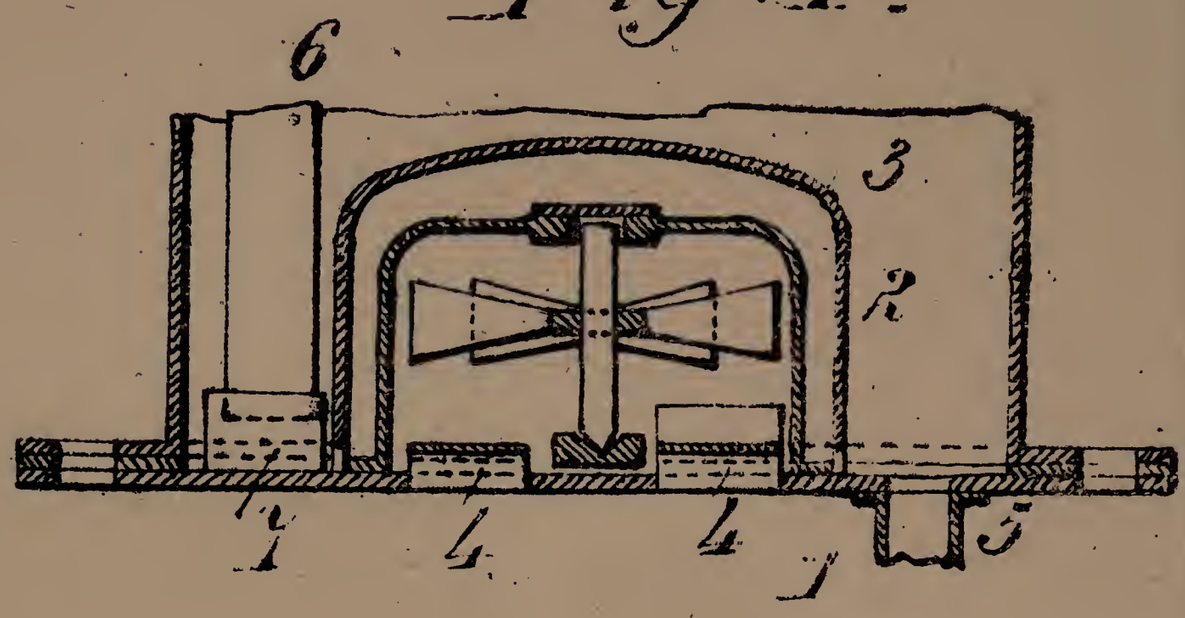
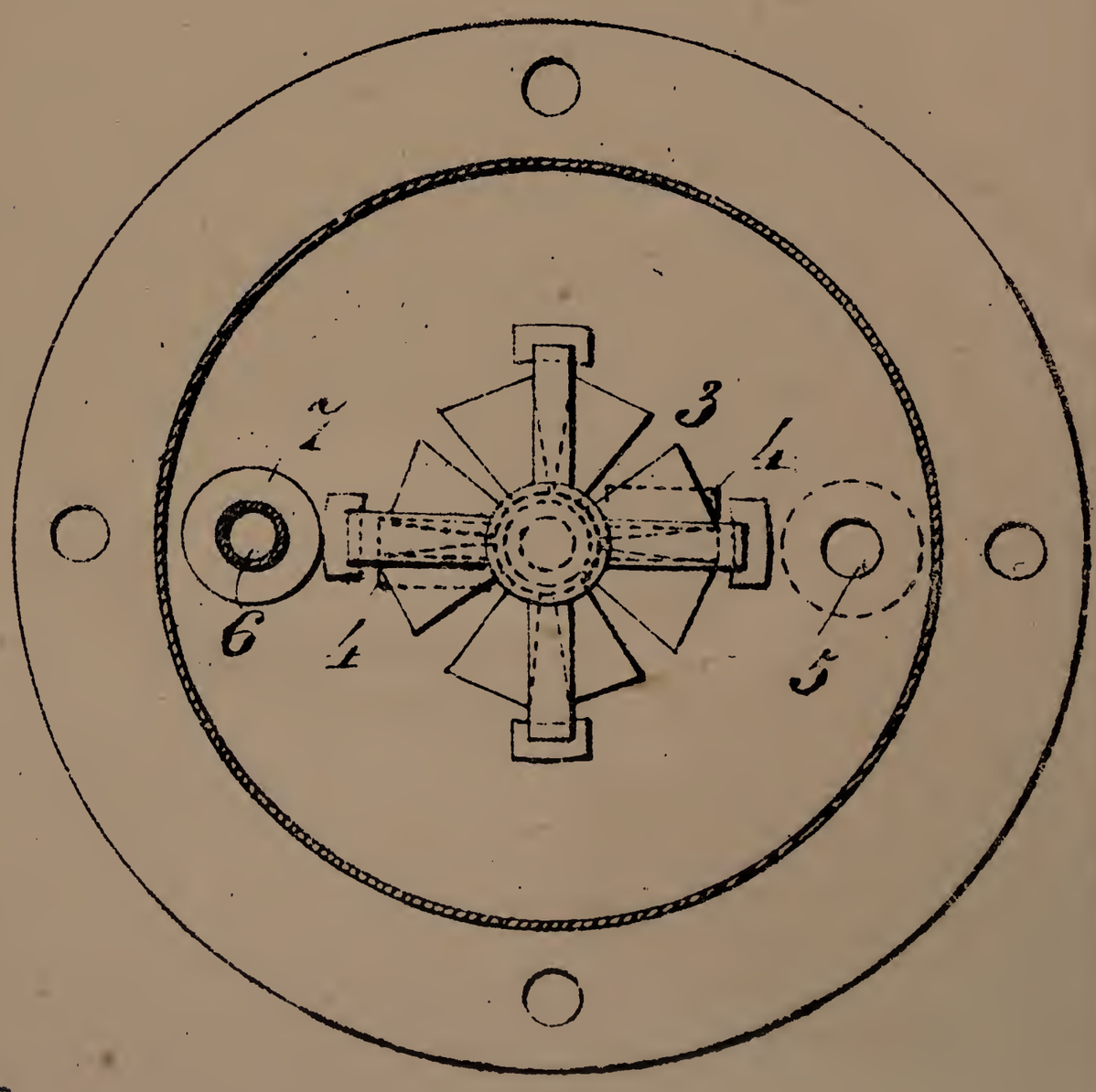


Fig. 2.



[This Drawing is a reproduction of the Original on a reduced scale.]

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